

CLAIMS

What Is Claimed Is:

1. A humidity control device for use in a food case for maintaining a desired humidity, said device comprising a protective case, a water vapor permeable pouch and a thickened saturated salt solution, said food case comprising wall means defining an enclosure, said wall means including a plurality of openings through which water vapor may freely move, said pouch being formed of a thin wall polymer film through which water vapor may pass, said thickened saturated salt solution comprising water, salt and a thickening agent, said salt being present in an amount between 20 and 75 percent by weight based on the weight of the combination of water and salt, said thickening agent being present in an amount sufficient to thicken the salt solution, said thickened saturated salt solution being contained within the polymeric pouch and sealed from escape from the pouch, said pouch containing the thickened saturated salt solution being contained within the protective case to protect the pouch from rupture.
2. The humidity control device of Claim 1 wherein the pouch provides moisture in the range of about 10 to 25 grams per 24 hours in an environment with a relative humidity of less than 5%.
3. The humidity control device of Claim 1 wherein the pouch provides moisture in the range for most applications is 5 to 15 grams per 24 hours in an environment with a relative humidity of less than 5%.

4. The humidity control device of Claim 1 wherein the pouch provides moisture in the range for most applications is 0.5 to 10 grams per 24 hours in an environment with a relative humidity of less than 5%.

5. The humidity control device of Claim 2 wherein the polymer film is a member selected from the group consisting of Hytrel ® (DuPont), high density polyethylene, polyvinylchloride, oriented polystyrene, microporous polyolefin, and microfibrous polyolefin.

6. The humidity control device of claim 1 wherein the salt solution comprises a 60/40 mixture of NaCl and KCl by weight.

7. The humidity control device of claim 1 wherein the thickening agent comprises propylene glycol alginate.

8. The humidity control device of claim 1 wherein the thickening agent comprises brine tolerant xanthan.

9. The humidity control device of claim 1 wherein the case comprises a tubular structure having openings of between about 1/18th inch by 1/8th inch.

10. The humidity control device of claim 9 wherein the case includes a pair of removable end caps.

11. The humidity control device of claim 10 wherein the case is constructed of a polymer.

12. The humidity control device of claim 10 wherein the case is about 2 to 5 inches in length and 5/8th to 3/4 inches in internal diameter.

13. The humidity control device of claim 10 wherein the device includes a securement mechanism for attaching the device to the inside of a food case.

14. A humidity control device for maintaining a desired humidity said device comprising a protective case, a water vapor permeable pouch and a thickened saturated salt solution, said case comprising wall means defining an enclosure, said wall means including a plurality of openings through which water vapor may freely move, said pouch being formed of a thin wall polymer film through which water vapor may pass, said thickened saturated salt solution comprising water, salt and a thickening agent, said thickening agent being present in an amount sufficient to thicken the salt solution, said salt solution being contained within the polymeric pouch and sealed from escape from the pouch, said pouch containing the thickened salt solution, said pouch being contained within the protective case to protect the pouch from rupture.

15. The humidity control device of claim 14 wherein the saturated salt solution has salt present at a level of 5% to 90% salt by weight.

16. The humidity control device of claim 15 wherein the salt solution has a viscosity of 7500-10,000 cps.

17. The humidity control device of claim 15 wherein the salt solution has a viscosity of 2500-7500 cps.

18. The humidity control device of claim 15 wherein the salt solution has a viscosity of 1500-5,000 cps.

19. The humidity control device of claim 15 wherein the salt solution is a self-standing non-flowing gel.

20. The humidity control device of claim 15 wherein the polymer film is a member selected from the group consisting of high density polyethylene, oriented polystyrene, microporous polyethylene, microfibrous polyethylene and polyvinylchloride.

21. The humidity control device of claim 15 wherein the film has a moisture transfer rate of at least 0.1 grams per 100 square inches per 24 hours.

22. The humidity control device of claim 15 wherein the film has a moisture transfer rate in the range of about 10 to 25 grams per 24 hours per 100 square inches of film.

23. A method of controlling the humidity in a string foods case comprising applying a humidity control mechanism to environment in the foods case, said mechanism including an encased saturated salt solution, said encasement being permeable to water vapor to permit water vapor to leave the salt solution if the adjacent relative humidity is below a desired level and to pick up water vapor if the relative humidity is above a desired level.

24. A humidity control device for use in maintaining a desired humidity, said device including a water vapor permeable pouch and a thickened saturated salt solution, said pouch being formed of a thin wall polymer film through which water vapor may pass, said thickened saturated salt solution comprising water, salt, and a thickening agent, said salt being present in an amount of between 20 and 75 percent by weight based on the weight of the combination of water and salt, said thickening agent being present in amount sufficient to thicken the salt solution, said salt solution being

contained within the polymeric pouch and sealed from escape from the pouch, said pouch containing the thickened salt solution being contained within the protective case to protect the pouch from rupture.

25. The humidity control device of Claim 24 wherein the polymer film has a thickness of between 0.15 mils and 2.0 mils.

26. The humidity control device of Claim 24 wherein the polymer film is a member selected for the group consisting of high density polyethylene, oriented polystyrene, polyvinylchloride, microporous polyethylene, Hytrel® (DuPont), and microfibrous polyethylene.

27. The humidity control device of claim 26 wherein the salt solution comprises approximately a 60/40 mixture of KCl and NaCl by weight.

28. The humidity control device of claim 27 wherein the thickening agent comprises xanthan gum.

29. The humidity control device of claim 24 wherein said thickening agent is a member selected from the group consisting of hydrocolloids and propylene glycol alginate.

30. The humidity control device of claim 24 wherein said thickening agent is a member selected from the group consisting of soluble gums, protein gels and inorganic polymers.

31. The humidity control device of claim 24 wherein said thickening agent is a member selected from the group consisting of alginate, xanthan, and pectin.

32. The humidity control device of claim 27 wherein said thickening agent is a member selected from the group consisting of egg albumen and gelatin.

33. The humidity control device of claim 27 wherein said inorganic polymer thickening agent comprise silicates.

34. The humidity control device of claim 27 wherein said salt comprises a cation member selected of ammonium, sodium, potassium, calcium, magnesium, lithium, strontium and an anion member selected from the group consisting of chloride, iodide, bromide, nitrite, nitrate, carbonate, phosphate, sulfate, and citrate.

35. The humidity control device of claim 27 wherein said salt is a member selected from the group consisting of sucrose, sorbitol, mannitol, glucose, 1-methylglucose, xylitol, sodium or potassium acetate, citric acid, and sodium citrate.

36. A humidity control device for use in maintaining a desired humidity, said device including a water vapor permeable pouch and a saturated solution, said pouch being formed of a thin wall polymer film through which water vapor may pass, said saturated solution comprising water and solute, said solute being present in an amount of between 20 and 75 percent by weight based on the weight of the combination of water and solute, said solution being contained within the polymeric pouch and sealed from escape from the pouch.

37. The humidity control device of claim 36 further wherein an oxygen scavenger is added to the pouch.

37. The humidity control device of claim 37 wherein the oxygen scavenger comprises between 1 and 5 percent of reduced iron with particle size of between 100 and 325 mesh.

38. The humidity control device of claim 37 wherein the oxygen scavenger comprises between 0.25 and 7.5 percent of reduced iron with particle size of between 100 and 325 mesh and a means for increasing the pH to greater than 7.0.

39. The humidity control device of claim 37 wherein the oxygen scavenger comprises between 0.5 and 7.5 percent of metallic zinc powder means for increasing the pH to greater than 7.0.

40. The humidity control device of claim 37 wherein the oxygen scavenger further comprises a metal powder selected from the group consisting of manganese, chromium, cobalt, and nickel and a means for increasing the pH to greater than 7.0.

41. The humidity control device of claim 37 wherein the oxygen scavenger comprises 0.001 to 0.05 percent of catalytic salt having a cation selected from the group consisting of ferrous and manganese⁺⁺ and the anion selected from the group consisting of sulfate and chloride.

42. The humidity control device of claim 36 further comprising between 0.025 and 0.2 percent of a mold inhibitor wherein the mold inhibitor is selected from the group consisting of sodium propionate, potassium propionate, calcium propionate, potassium sorbate, sorbic acid, benzoic acid, and sodium benzoate.

43. The humidity control device of claim 36 further comprising a potassium sorbate coating applied to the surface of the pouch at a rate of between 50 and 300 mg. per

100 square inches of surface using a process selected from the group consisting of spraying, dipping, and printing.

44. The humidity control device of claim 36 further comprising a potassium sorbate coating applied to the surface of the pouch at a rate of between 100 and 200 mg. per 100 square inches of surface using a process selected from the group consisting of spraying, dipping, and printing.

45. The humidity control device of claim 36 further comprising a propionate coating applied to the surface of the pouch at a rate of between 50 and 300 mg. per 100 square inches of surface, the propionate coating selected from the group consisting of sodium propionate, potassium propionate and calcium propionate, and using a process selected from the group consisting of spraying, dipping, and printing.

46. The humidity control device of claim 36 further comprising a benzoate coating applied to the surface of the pouch at a rate of between 25 and 200 mg. per 100 square inches of surface, the propionate coating selected from the group consisting of sodium benzoate and potassium benzoate, and using a process selected from the group consisting of spraying, dipping, and printing.